

# PATENT COOPERATION TREATY

**CONFIRMATION**

From the:  
INTERNATIONAL SEARCHING AUTHORITY

**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Best Available Copy

<b>To:</b>  Lawrence Y.D. HO 30 Bideford Road #07-02/03 Thongsia Building SINGAPORE 229922			<b>Date of mailing</b> (day/month/year) <b>2 FEB 2005</b>
<b>Applicant's or agent's file reference</b> 1138P042PCTj		<b>FOR FURTHER ACTION</b> See paragraph 2 below	
<b>International application No.</b> PCT/SG2004/000330	<b>International filing date</b> (day/month/year) 8 October 2004	<b>Priority date</b> (day/month/year) 8 December 2003	
<b>International Patent Classification (IPC) or both national classification and IPC</b> Int. Cl. <sup>7</sup> G06T 7/60, G06F 19/00			
<b>Applicant</b> NANYANG POLYTECHNIC et al			

**1. This opinion contains indications relating to the following items:**

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input checked="" type="checkbox"/> | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application   |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application  |

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

<b>Name and mailing address of the IPEA/AU</b> AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	<b>Authorized Officer</b>  <b>MATTHEW HOLLINGWORTH</b> Telephone No. (02) 6283 2024
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Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:  

☒ paid additional fees  
☐ paid additional fees under protest  
☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1; 13.2 and 13.3 is  

☐ complied with  
☒ not complied with for the following reasons:

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are two inventions:

1. Claims 1-21, directed to a method for automatic inspection of a microarray slide. The use of a dilated image to calculate the orientation of the slide is considered to be a first "special technical feature."
2. Claims 22-28, directed to a system for automatic inspection of a microarray slide. Prima facie, this invention does not appear to have any "special technical features," since it includes only well-known integers and well-known combinations of computing apparatus.

Since the abovementioned groups of claims do not share any technical features, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly, the international application does not relate to one invention or to a single inventive concept.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

- ☒ all parts  
☐ the parts relating to claims Nos.

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**Box No. V**      **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims 1-21, 27	YES
	Claims 22-26, 28	NO
Inventive step (IS)	Claims 1-21, 27	YES
	Claims 22-26, 28	NO
Industrial applicability (IA)	Claims 1-28	YES
	Claims	NO

**2. Citations and explanations:**

- D1: P. Bajscy, *Gridline: Automatic Grid Alignment in DNA Microarray Scans*
- D2: EP 1 450 304 A1 (CITY UNIVERSITY OF HONG KONG), 25 August 2004
- D3: T. Srinark et al, *A Microarray Image Analysis System Based on Multiple-Snake*
- D4: C. Uehara et al, *Towards Automatic Analysis of DNA Microarrays*
- D5: WO 2002/004123 A1 (ROBODESIGN INTERNATIONAL, INC.), 17 January 2002
- D6: *arrayWoRxeAuto Automated Biochip Reader* product brochure, as archived 29 May 2003
- D7: *ScanArray Express Microarray Scanner* product brochure, as archived 19 July 2003

**NOVELTY (N) and INVENTIVE STEP (IS) claims 1-28**

Claims 1-21 and 27: Documents D1-D4 represent the closest available prior art. The features of the claimed invention are not disclosed in these documents, or in any others published before the earliest priority date of the claims. In particular, the use of a morphologically dilated image of a microarray to determine its alignment appears to be novel and inventive.

Claims 22-24: D5-D7 each disclose all the essential features of the claimed invention.

Claims 25-26: D5 and D6 also disclose the features of this claim.

Claims 22-26 and 28: These claims lack inventive step in light of any of D5-D7. The additional features provided by the dependent claims, when not disclosed, are not considered to confer inventive step to the claims.